travels in Mongolia and the Land of the Tunguts is continued also.

AT Monday's meeting of the Royal Geographical Society, the principal business was the reading of papers on the interior of New Guinea, by Mr. Stone and Mr. Macfarlane. The writers had found the coast district of New Guinea too barren "even for the cultivation of the banana," but concurred in stating that the country improved considerably as they travelled inland. There they found great fertility, a kind, hospitable people, and a country comparatively free from fever, whereas the coast was barren, the people were morose and warlike, and the climate was destructive of the health of Europeans.—No communication was made respecting Lieut. Cameron, but it was understood that at the last advices he was with his party at Loanda.

THE general staff of the German empire has published a report of experiments made in Germany on ballooning at the expense of the Imperial Government. The conclusions throw no new light on the subject, but the German officers believe that the mechanical direction of balloons is by no means an impossibility. They even suppose that the problem of ascending or descending without using ballast or the valve, is very likely to receive a speedy solution. They propose to the Government to determine by means of experiments what is the best diameter for the helix when it is applied to a balloon of a certain capacity. They propose also to try the efficacy of wings for propelling balloons. They are not of the common opinion that the diameter of balloons can be indefinitely enlarged.

MISS SHEEPSHANKS has presented to the Royal Astronomical Society 200 volumes of works on Astronomy, some of them very rare; and Lord Lindsay has presented a large and valuable collection of the late Mr. Carrington's MSS. on the subject of sun-spots.

AT the last regular meeting of the Berlin Geographical Society, Herr Kiefert read a paper on the African Expedition of Lieut. Cameron, which he described as epoch-making, and declared that the general results were the most important since Livingstone.

THE Museum of Paris has lost the services of two of its most eminent professors, M. Milne-Edwards in zoology, and M. Delafosse in mineralogy; they have been placed on the retired list on account of old age. M. Milne-Edwards has been succeeded by his own son, a promising naturalist, and M. Delafosse, by M. Decloizeaux, a member of the Institute.

ON the 4th inst. the Berlin University held an extraordinary meeting to celebrate the fiftieth anniversary of the day on which Prof. Dove was received a doctor. An address was handed to him by Professors Mommsen and Du Bois-Reymond. The Minister of Public Instruction was present, and a magnificent vase was presented to Dr. Dove on behalf of the Emperor of Germany. In the evening a banquet took place at the English Hotel. Among those present were Prof. Helmholtz and a number of other German scientific notabilities.

THE Société Française de Navigation Aérienne has awarded a gold medal and diploma "for devotion to science," to Mr. F. W. Brearey, honorary secretary to the Aeronautical Society of Great Britain.

THE change of Ministry has been completed in France, and M. Wallon is no longer the Minister of Public Instruction. The learned gentleman left behind many warm sympathisers. His successor appointed last Friday is Mr. Waddington, an Englishman by parentage, born in France in 1828, naturalised a Frenchman, and a member of the Senate, but a Protestant by religion, and educated at Rugby and Cambridge. Great efforts are likely to be made to secure for France competent representation at the forthcoming Scientific Loan Exhibition.

THE Cambridge Museums and Lecture-rooms Syndicate report the urgent necessity for increased accommodation in the departments of zoology, comparative anatomy, and physiology, and recommend that steps be at once taken to supply the want. They suggest the erection of a building on a site adjacent to the present museums, to consist of three floors, with cellars under the central portion.

M. HARENT, the director of a private institution, is now the President of the Municipal Council of Paris. He has deposited a formal proposition asking the Council to establish several meteorological observatories for the analysis of rain, water, air, electrical determinations, and ordinary barometer and temperature readings. All these establishments are to be modelled after that of Montsouris, but on a smaller scale.

THE Daily *Bulletin* of Weather Reports for March 1873 issued by the chief signal officer of the War Department of the United States, has been received. The publication gives on a reduced scale the whole of the tri-daily weather maps for the month, each map being accompanied with (1) the synopsis of the weather conditions, and (2) probabilities of the weather during the next twenty-four hours, drawn from these conditions, and stated on each map at the time of its publication, together with (3) a statement of the actual facts as they occurred with which the "forecasts" of the office may be compared. This fearless and straightforward course of exhibiting equally its successes and its failures, is deliberately adopted by the office in order to facilitate inquiry by scientific men, into the theories and causes which have led to these successes and failures, from which inquiries the practical work of the office cannot fail to reap most substantial benefit.

THE additions to the Zoological Society's Gardens during the past week include 171 Sand Lizards (*Lacerta agilis*) from Italy, presented by Mr. H. Negretti; two Forster's Milvagos (*Milvago australis*) from the Falkland Isles, presented by Lord Lilford; a Great Frigate Bird (*Frigata aquila*) from America, three Black-backed Geese (*Sarcidiornis melanota*) from India, a Gull-billed Tern (*Sterna anglica*), European, a Crested Hangnest (*Ostinops cristatus*), a Cayenne Lapwing (*Vanellus cayennensis*) from South America, an Ogilby's Rat Kangaroo (*Hypsiprymnus ogilbyi*), a Vulpine Phalanger (*Phalangista vulpina*) from Australia, purchased; a Jackal Buzzard (*Buteo jacal*) from Africa, deposited; a Yellow-footed Rock Kangaroo (*Petrogale xanthopus*).

SOCIETIES AND ACADEMIES

LONDON

Royal Society, Feb. 3.—On Formulæ of Verification in the Partition of Numbers, by J. W. L. Glaisher, M.A., F.R.S.

Feb. 17.—"Researches upon the Specific Volumes of Liquids." By T. E. Thorpe, Ph.D., F.R.S.E., Professor of Chemistry in the Yorkshire College of Science, Leeds.

II. *On the Specific Volumes of certain similarly-constituted Inorganic Chlorides.*

The results of the observations made by Pierre and Kopp upon the boiling-points, specific gravities, and thermal expansibilities of the trichlorides and tribromides of phosphorus, arsenic, and antimony, have led Kopp to suppose that the specific volumes of phosphorus, arsenic, and antimony, in their liquid combinations, may be identical. The same conclusion has been drawn with respect to tin, titanium, and silicon from Pierre's observations upon the tetrachlorides of these elements.

The common value of P, As, and Sb would appear to be about 27, that of Si, Ti, and Sn about 35. But on examining the details of the observations, it becomes evident that this conclusion is not strictly borne out by the results; the numbers obtained for the individual members of the group differ in many cases considerably from the common value, the divergences being far wider than could arise from errors of observation, either in the determination of the physical constants or in the estimation

of the atomic weights of the constituent bodies. In fact the order of the divergences would seem to render it probable that the specific volumes of the several members of a family of elements increase with their atomic weights.

In a former communication to the Royal Society the author has given the results of a series of observations on the specific gravities, boiling points, and rate of expansion of certain liquid chlorides of phosphorus. Since Roscoe has shown that vanadium is a member of the phosphorus group of elements, it appeared to him that a comparison of the specific volumes of the analogously constituted phosphoryl and vanadyl trichlorides might serve to throw additional light on this question of the relation of the specific volumes of the members of a family of elements to their atomic weights.

Three determinations of specific gravity of phosphoryl trichloride made with different bottles gave a mean number of 1·71185 at 0° compared with water at same temperature; compared with water at 4° the specific gravity is 1·71163.

The rate of expansion of phosphoryl trichloride from 0° to its boiling-point may be accurately represented by the expression—

$$V = 1 + 0{\cdot}001\,064\,309t + 0{\cdot}000\,001\,126\,66t^2 + 0{\cdot}000\,000\,005\,299t^3.$$

Its specific gravity at 107·23 is 1·50987; hence its specific volume $= \frac{153{\cdot}38}{1{\cdot}50987} = 101{\cdot}58$.

The results obtained with the dilatometer in the case of vanadyl trichloride may be represented by the formula

$$V = 1 + 0{\cdot}000\,965\,236t + 0{\cdot}000\,000\,898\,26t^2 + 0{\cdot}000\,000\,003\,191\,63t^3.$$

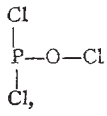
The mean of three experiments gives the specific gravity of vanadyl trichloride at 0°, compared with water at 4°, as 1·86527.

The specific gravity of vanadyl trichloride at 127°·19 is 1·63067; hence its specific volume is $\frac{173{\cdot}73}{1{\cdot}63067} = 106{\cdot}54$.

It is thus evident that the specific volumes of vanadyl and phosphoryl trichlorides are not equal; the compound with the higher molecular weight has the greater specific volume.

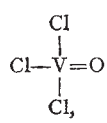
In the communication on the chlorides of phosphorus already referred to, it is shown that if it be assumed, as appears in the highest degree probable, that there is a relation between the manner in which the oxygen atoms in a compound are held in union and their specific volume, it follows that the oxygen atom in $POCl_3$ possesses the smaller of the two values 12·2 and 7·8 assigned by Kopp to oxygen, and accordingly that this atom is attached to the phosphorus by only one combining unit.

Thus—



showing that the phosphorus atom in phosphoryl trichloride possesses the same atomic value as in phosphorus trichloride.

As the difference between the two values for the volume of oxygen, viz., 12·2 − 7·8 = 4·4, is but little less than between the specific volumes of $VOCl_3$ and $POCl_3$, viz., 106·54 − 101·58 = 4·96, it is possible that the difference in the specific volumes of the two liquids may be due to the different manner in which the oxygen atoms are united to the vanadium and phosphorus atoms; for, if V be regarded as a pentad, $VOCl_3$ must be written—



the oxygen atom having the value 12·2. Assuming Kopp's value for Cl, viz. 22·8, this would leave for P and V nearly the same specific volume, viz. :—

P	25·4
V	25·9

From the uncertainty respecting the particular volume to be assigned to the oxygen atom in vanadyl trichloride, our knowledge of the specific volumes of $VOCl_3$ and $POCl_3$ gives us little aid towards solving the question whether the several members of a family of elements have identical specific volumes.

With a view to obtain further evidence, the author has redetermined with special care the boiling-points, specific gravities, and rates of expansion of the tetrachlorides of silicon, titanium, and tin.

The atomic weights of Si and Ti and of P and V show about the same gradational difference :—

Si	28·10	P	31·00
Ti	50·00	V	51·35

And, since the tetrachlorides are free from oxygen, the uncertainty arising from the specific volume of that element is eliminated. He has also compared the specific volumes of the trichlorides of phosphorus, arsenic, and antimony, making use of Kopp's determination in the case of the last-named compound. Material is thus obtained for the discussion of the question from analogous derivatives of two well-defined groups of elements, viz. :—

Si	28·10	P	31·00
Ti	50·00	V	51·35
		As	55·15
Sn	118·10	Sn	122·30

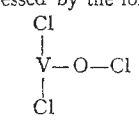
The results of the determinations of the specific volumes of the tetrachloride of silicon, titanium, and tin, liquids of analogous constitution and all derivatives of the tetrad group of elements, serve to establish the conclusion indicated by the difference in the specific volumes of phosphoryl and vanadyl trichlorides, that the specific volumes of the several members of a family of elements are not identical, but that the specific volume increases with the atomic weight of the member.

	Molecular weight.	Specific volume.
$SiCl_4$	169·94	121·13
$TiCl_4$	191·84	126·03
$SnCl_4$	259·94	131·41

It is also noteworthy that the difference between the specific volumes of tin and titanium tetrachlorides is almost the same as the difference between the specific volumes of vanadyl and phosphoryl trichlorides; the difference between the atomic weights of vanadium and phosphorus is nearly the same as that between the atomic weights of titanium and silicon.

	Mol. weight.	Diff.	Spec. vol.	Diff.
$POCl_3$	153·38	20·35	101·58	4·96
$VOCl_3$	173·73		106·54	
$SiCl_4$	169·94	21·9	121·13	4·90
$TiCl_4$	191·84		126·03	

It would seem from this that the constitution of vanadyl trichloride is similar to that of the phosphoryl compound, and must therefore be expressed by the formula—



in which V appears as a triad, the oxygen atom having the same specific volume as in phosphoryl trichloride. On the other hand, the order of the divergences shown by P, As, and Sb (*vide infra*), would appear to indicate that V may be pentad in this compound, whence O would have the volume 12·2.

The numbers representing the specific volumes of the trichlorides of phosphorus, arsenic, and antimony exhibit a gradational order similar to that shown by the volumes of the tetrachlorides of silicon, titanium, and tin, and also by the specific volumes of phosphoryl and vanadyl trichlorides :—

	Mol. weight.	Spec. vol.
PCl_3	137·38	93·54
$AsCl_3$	181·53	94·64
$SbCl_3$	228·68	97·82

although the differences are much less than in the cases of the two latter groups.

III. *On the Specific Volumes of Bromine and Iodine Monochloride; and of Ethene Bromide and Ethene Chloriodide.*

The molecular weight of bromine is, as is well known, nearly equal to the arithmetic mean of the molecular weights of chlorine and iodine: hence the molecular weights of bromine and of iodine monochloride (ICl) are nearly identical. These substances closely resemble each other in physical properties. Both are dark-red liquids about three times heavier than water. Bromine boils at about 59°·5, and solidifies at −24°·5; iodine monochloride melts at + 24°·5, and boils at 101°: the interval between the boiling- and melting-points is therefore approximately equal.

It appeared to the author of interest to determine (1) if the specific volumes of these liquids exhibit a relation similar to that which is shown by their molecular weights; and (2) if the relation in their specific volumes is preserved in analogous combinations of the two bodies. He has accordingly determined the specific gravities, boiling-points, and rates of expansion of bromine and iodine monochloride, and of the compounds which these substances form by their union with ethene, C_2H_4. The observations also serve to determine if bromine and iodine monochloride preserve, when in combination, the volumes which they possess in the free state.

It is evident from the observations that the specific volumes of bromine and iodine chloride are not equal, neither are the specific volumes of ethene bromide and ethene chloriodide; the bodies with the greater molecular weights have the greater specific volumes.

	Molecular weight.	Specific volume.
Bromine	159·90	53·62
Iodine chloride	162·31	56·32
Ethene bromide	187·90	97·30
Ethene chloriodide... ...	190·31	101·27

The number obtained for iodine monochloride differs considerably from the volume calculated by means of Kopp's values (Cl = 22·8, I = 37·5), viz., 60·3. The specific volume of bromine (Br_2) is also less than Kopp's number, 55·6. The value assigned to chlorine is unquestionably far more accurate than that given to iodine, since the value of the latter element was calculated from only two or three compounds, whereas the former number was deduced from a comparatively large number of chlorinated products. That the value for iodine needs revision seems to be confirmed by Billet's observations of the specific gravities of liquid iodine at various temperatures. If his results be plotted down and the curve prolonged to the boiling-point of iodine, we find that the specific gravity of iodine at this point is 3·780; hence the specific volume of iodine (I.)—

$$= \frac{126·85}{3·780} = 33·5.$$

If now this value be added to that of chlorine as given by Kopp, we get a result identical with the observed volume of iodine monochloride—

$$33·5 + 22·8 = 56·3.$$

If we subtract the specific volumes of C_2H_4, as calculated by the aid of Kopp's values (C = 11, H = 5·5, C_2H_4 = 44), from the specific volumes of ethene bromide and ethene chloriodide, we obtain numbers which are nearly equal to the specific volumes of bromine and iodine chloride respectively—

$$97·30 - 44 = 53·30.$$
$$101·27 - 44 = 57·27.$$

This correspondence between the two sets of values seems to warrant the conclusion that bromine and iodine chloride possess the same volume in a compound which they have when in the free state.

It is not unreasonable to suppose that the same may be true of ethene itself, viz., that at its boiling-point it would possess the same volume which it has in the bromide and chloriodide at their respective boiling-points. On this assumption the specific gravity of liquid ethene would be—

Calculated from $C_2H_4Br_2$	0·641
,, ,, C_2H_4ICl	0·624

Chemical Society, March 2.—Prof. Abel, F.R.S., president, in the chair.—This meeting was entirely occupied with the discussion of the various points in connection with water analyses, raised by Dr. Frankland's lecture at the previous meeting. The debate, which lasted until a late hour, turned chiefly on the respective merits of Frankland and Armstrong's "combustion method," and of the "albumenoid ammonia process" of Wanklyn, Chapman, and Smith, for determining the amount of impurity in potable waters.

Mathematical Society, March 9.—Wm. Spottiswoode, F.R.S., vice-president, in the chair.—Messrs. Cockshott and R. T. Wright were elected members, and Messrs. Elliott, Leudesdorf, and Russell admitted into the Society.—Prof. Cayley made communications on the bicursal sextic and on the problem of three-bar motion. The discovery by Mr. Samuel Roberts of the triple generation of a three-bar curve throws a new light on the whole theory, and is a copious source of further developments. Prof. Cayley gives in its most simple form the theorem of the triple generation; he also establishes the relation between the nodes and the foci, and further gives other researches. The two papers are intimately related to one another.—Prof. Clifford spoke on the classification of geometric algebras. He sketched out what had been done by Argaad (1806); Möbius (1827); Peacock and the Cambridge School (1834); Hamilton (1843); Grässmann (1844, 1862); Peirce (1870); and mentioned results he has himself obtained, for some of which he had not yet got satisfactory explanations.

Zoological Society, March 7.—Dr. A. Günther, F.R.S., vice-president, in the chair.—Dr. Günther exhibited and made remarks on specimens of a minute Australian mammal (*Antechinus minutissimus*) and of a species of *Palythoa* parasitic on a Mediterranean sponge.—Prof. Garrod read a paper on the anatomy of the Courlan (*Aramus scolopaceus*), which he regarded as showing in many respects a close affinity to the Cranes (*Grus*).—A communication was read from Mr. T. E. Buckley, containing remarks on the past and present geographical distribution of the larger mammals of South Africa.—Dr. Cobbold, F.R.S., read the fourth of his series of notes on Entozoa.—Sir Victor Brooke, Bart., read some supplementary remarks on the newly discovered Persian Deer (*Cervus mesopotamicus*), based on additional specimens and information received from Mr. Robertson, H.B.M. Vice-Consul at Busreh.—A second communication from Sir Victor Brooke contained further observations on Schomburgk's Deer (*Cervus schomburgki*) of Siam.

Royal Microscopical Society, March 1.—Mr. H. C. Sorby, F.R.S., president, in the chair.—A paper was read by Mr. W. Hartley, F.C.S., descriptive of certain observations and experiments on the fluids contained in quartz cavities, and which appeared to be liquid carbonic acid, mixed in most cases with water. The subject was illustrated by drawings and by specimens, and experimental demonstrations under the microscope.—A paper was also read by Mr. F. Rutley on the structure of certain rocks, Obsidian and Leucite, and on the spheroidal structure observed in the perlites. The subject was freely illustrated by diagrams and specimens exhibited in the room. A paper by the Rev. W. H. Dallinger, on a new arrangement for illuminating and centering for high powers, was taken as read, it being understood that though of great interest it could not readily be explained without the numerous illustrations by which it was accompanied.

Institution of Civil Engineers, Feb. 22.—Mr. G. R. Stephenson, president, in the chair. The paper read was on the Probable Errors of Levelling, with Rules for the Treatment of Accumulated Errors," by Mr. Wilfred Airy, B.A.

Feb. 29.—Mr. Geo. Robt. Stephenson, president, in the chair.—The first paper read was on the floods in England and Wales during 1875, and on water economy, by Mr. George James Symons, secretary to the Meteorological Society.—The second paper read was on evaporation and on percolation, by Mr. Charles Greaves.

Victoria (Philosophical) Institute, March 6.—A paper on the Horus myth in its relation to Christianity, was read by Mr. W. R. Cooper, F.R.A.S.

MANCHESTER

Literary and Philosophical Society, Dec. 6, 1875.—Mr. C. Bailey, vice-president, in the chair.—Mr. Sidebotham, F.R.A.S., sent for exhibition some sand from a river far inland of New Guinea, containing particles of gold, magnetic and non-magnetic iron, foraminiferæ, silicified fragments of echini, and shells.—Mr. J. Cosmo Melvill exhibited two specimens of the Spurge Hawk Moth (*Deilephila euphorbiæ*), said to have been captured in the larval state at Ecclesbourne, near Hastings, feeding in all probability on *Euphorbia amygdaloides*, as he subsequently visited the spot and could see no trace of any other Spurge.

Jan. 17.—Mr. John Barrow in the chair.—Mr. Sidebotham, F.R.A.S., exhibited a magnified drawing and specimens of *Lymexylon navale* from Dunham Park, and read a short paper on the life history of the insect, which he and Mr. Chappell had studied since its discovery in Dunham Park in 1872. Mr. Sidebotham also read a paper on *Psammodius sulcicollis*, and exhibited specimens taken at Southport in 1875.—Mr. Plant exhibited various objects of interest, including a Longicorn Beetle (*Astinomus ædilis*) from a coal mine near Manchester; also cases of a North American Caddis Worm (*Phryganea* sp.) much resembling a mollusc of the genus Valvata, and once named by Lea *Valvata arenicola*.

GENEVA

Physical and Natural History Society, Jan. 20.—Dr. Prevost, Head Physician to the Geneva Cantonal Hospital, presented a photograph of the brain of a person who had been affected with aphasia. The lesion, which consists in a slightly yellowish softening somewhat like cicatrisation, occupies a space of about two centimètres on the posterior part of the third left frontal convolution. The meninges are adherent on a level with the diseased point. The "island" of Reil is healthy except at a point which touches the affected convolution. The interval separating two convolutions of the "island" presents a yellowish coloration, and contains granulous bodies. The convolutions themselves of the "island" are, on the other hand, sound. This brain belonged to a woman aged seventy-five years, affected for about a month with right hemiplegia without contractions and without loss of sensibility, and who presented an almost

complete aphasia. Incapable of speaking, she pronounced only isolated syllables without any meaning, as *Eh, eh :* Ah, oi ; - - - eh, *baba* - ah ! *ba, ba, za-za-ya*. One day she said *maman ;* this was the only comprehensible word she uttered. She succumbed twelve days after entry, to bronchitis, for which she came to the hospital. The lesion observed in this case is that which M. Broca regards as constant in cases of aphasia. It is known that M. Meynert and others, on the contrary, localise the faculty of speech in the lobule of the insula, which in the above case was scarcely touched. Dr. Prevost observed at the Cantonal Hospital another case of aphasia, in which the lobule of the insula was the seat of the lesion, while the third left frontal convolution was intact, and thinks we cannot localise exactly the faculty of language exclusively in either of the seats in question.

PARIS

Academy of Sciences, March 6.—Vice-Admiral Paris in the chair. The following papers were read :—Note on geodesic operations undertaken in Brazil, by General Morin. A Commission is to determine the position of a series of stations from Rio de Janeiro to the town of San Juan de Rio Claro, and the mouth of the Tiele in the Parana. There will be measured an arc of parallel of about 23° S. lat. and 9° to 10° in longitude ; and an arc of meridian from about 2° N. lat. to about 33½° S. lat. or more than 35½°.—Transformation of nautical astronomy through the progress of chronometry, by M. Yvon Villarceau.—Note on the steam jacketing of engine-cylinders, by M. Resal.—On the periodical variations or inequalities of temperature, by M. Sainte Claire-Deville. From further data he is able to show that the oscillation of the half of Nov. 1873 was perceptible over Europe, Asia, and America and the northern part of Africa ; that is, over nearly the whole northern hemisphere. A similar oscillation in November, 1874, seems to be established.—On a new simplification of the fundamental law of electrodynamics, by M. Clausius.—The Academy nominated candidates for the vacant chairs of zoology and mineralogy ; MM. Alph. Milne-Edwards and Oustalet, for the former, MM. Descloizeaux and Janettaz for the latter.—On the absorption of bicarbonates by plants in natural waters, by M. Barthélémy. *Inter alia*, these bicarbonates do not serve the respiratory action, for the quantity absorbed is not in proportion to the rapidity of vegetation. During night, and in water equally saturated, the plants seem to excrete a part of the bicarbonates absorbed by day.—M. Dupuy de Lôme presented a memoir, by M. Bertin, on the rolling of ships.—M. Andrade described a new governor for steam-engines.—M. de Rostaing spoke of the antiseptic properties of the root of madder. A piece of meat had been kept from July, 1875, to February 1876, in a pot containing the root in powder form, and which had frequently been opened. The weight was reduced from 119 to 25 grammes. There was no odour nor development of live organisms.—Methods of transformation based on conservation of an invariable relation between derivatives of the same order, by M. Haton de la Goupillière.—Geometrical demonstration of a relation due to M. Laguerre, by M. Mannheim.—On the photometry of stars, and the transparence of the air, by M. Trepied. The author tabulates the intensities calculated for various stars.—Analysis of the white smoke of a blast furnace in the neighbourhood of Longwy, by M. Gruner.—Action of electrolytic oxygen on glycerine, by M. Renard. The glycerine diluted with two-thirds of its volume of acidulated water, is submitted to the electrodes from six Bunsen elements ; after forty-eight hours the liquor is saturated with carbonate of lime, filtered, and distilled, giving a dilute solution of glyceric aldehyde. The white residue, after evaporation, has for formula $C_3H_6O_3$; M. Renard describes its properties.—Note on the calorific action of certain regions of the brain (vaso-motor apparatuses situated on the hemispheric surface), by MM. Eulenberg and Lander. These experiments were on young dogs, which were submitted to chloroform and curare, and the brain-surface burnt with hot copper wire and stimulated with induction currents. As thermo-electric elements, Dutrochet needles were inserted under the skin of the paws, and were connected with a very delicate galvanometer. The authors define the efficacious calorific region, and the relation of its parts, and they explain the results by vaso-motor apparatuses there which are probably connected with vaso-motor fibres in the peduncle of the brain.—On the action of biliary salts on the pulse, the tension, the respiration, and the temperature, by MM. Feltz and Ritter. It is shown that by injections of natural bile into the blood, in proportions that are not toxical, the pulse is diminished in frequency, the respiration is retarded, and the temperature and arterial tension are lowered.—Some remarks on MM. Feltz and Ritter's note, by M. Bouillaud.—On the *rôle* of the arterial bulb in fishes, by M. Carlet. *En resumé* (1) the bulb preserves the branchial arterioles from the shocks communicated by the heart ; (2) it facilitates the action of the heart ; (3) if its action be prevented, there immediately follows a considerable disorder of the hæmatosis.—Note on inverted sugar, by M. Maumené.

BOOKS RECEIVED

BRITISH.—Evolution of the Human Race from Apes : T. W. Jones, F.R.S. (Smith, Elder and Co.)—Scientific Culture : Josiah P. Cooke, jun. (H. S. King and Co.)—Memoirs of Caroline Herschel : Mrs. John Herschel (John Murray).—The Geological Record for 1874 : William Whitaker, F.G.S. (Taylor and Francis).—Medicinal Plants. Part V. ; Bentley and Trimen (Churchill).—Australian Heroes : Charles H. Eden (S.P.C.K.)

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